

Drought Planning:

**A new perspective on reducing
drought impacts**



Topics

- Drought concepts & challenges
- Drought planning & mitigation
- Plan implementation
- Local drought impact groups
- Conservation tips



Drought in Arizona

Drought is a prolonged period of below-average precipitation severe enough to negatively impact the environment and human activities

- Current drought began in the late 1990s
- Severity of the impact varies by location
 - Urban vs. rural areas
- Drought Emergency Proclamation in effect since June 1999
 - Governmental entities can provide response and recovery assistance
 - Disaster Designation by the U.S. Department of Ag in May 06
- Drought Declaration issued on May 22, 2007

Drought: Key Concepts

- One rain does not end a drought
- Impacts domestic water supplies, ranching and farming production, vegetation, forest health and wildlife populations



Drought Challenges

“Drought is the Rodney Dangerfield of natural hazards... it doesn't get the respect that other natural hazards do.”

- On average, drought is the most expensive natural disaster – \$6-8 billion annually in losses
- Slow-onset, effects accumulate slowly, hard to determine beginning and end



Drought Planning

↓ Shifts focus from crisis management to **RISK MANAGEMENT**

- Improved monitoring, forecasts, early warning systems
- Preparedness and mitigation plans
- Emergency response programs are the last resort – not the only



Drought Planning



Hazard Mitigation –

any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards



Why Drought Planning?

- Drought isn't just about climate – it has a social component over which we have control
- More effective than drought response
 - Emergency relief is too little too late
- Less expensive than response



We cannot control the atmosphere in order to prevent drought;
however, we can take action to reduce our vulnerability to drought.

How Can We Mitigate Drought?

- Use natural resources in a sustainable manner
- Conflict resolution among water users
- Augment water supplies, reduce water demand
- Monitoring and early warning systems
- Risk assessments
- Improve coordination among government agencies
- Public education

Conserve



Governor's Drought Task Force

Arizona Drought Preparedness Plan - 2004

Arizona Statewide Water
Conservation Strategy

Arizona Drought Preparedness Plan
OPERATIONAL DROUGHT PLAN



Governor's Drought Task Force
Governor Janet Napolitano
October 8, 2004

- Identify the impacts of drought to the various sectors of water users
- Define sources of drought vulnerability
- Outline monitoring programs
- Prepare response options and mitigation strategies to reduce drought impacts

AZ's plan emphasizes drought planning and preparedness, innovation and action

Statewide Drought Program

www.azwater.gov

Department of Water Resources

Links | Meetings & Notices Calendar | Contact Us

Keyword Search GO

Statewide Drought Program

Home | Community Water Systems | Local Area Impact Assessment Groups | Monitoring Technical Committee | Interagency Coordinating Group | Resources | Contact Us

Providing statewide assistance for drought preparedness, mitigation and response



Photo credits USDA-NRCS

Drought Planning is important because...

Quick Links



Short Term Drought Status

- System Water Plan Guidance
- System Water Plan Form
- Community Water System FAQs
- Arizona Drought Preparedness Plan
- USDA Disaster Designation
- Arizona Firewise Communities

Internet

Novell GroupWis... Mail From: "Gre... Microsoft Power... Arizona Drought... 10:16 AM

Providing statewide assistance for drought preparation, mitigation and response

"State efforts should not attempt to preempt local prerogatives, but rather endeavor to inform, guide, and assist local efforts" (Western Governor's Association).

State Water Conservation Programs



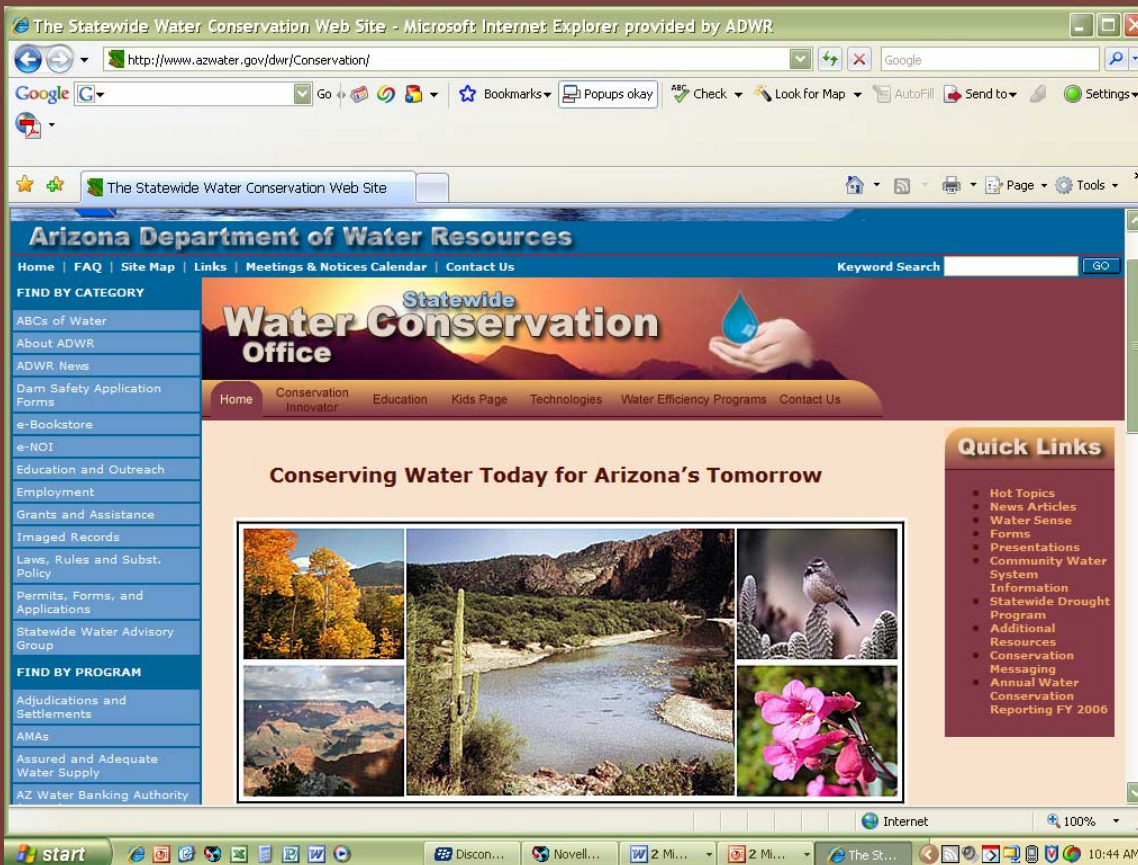
Planning

Funding & Assistance

Education & Outreach

Technology Transfer

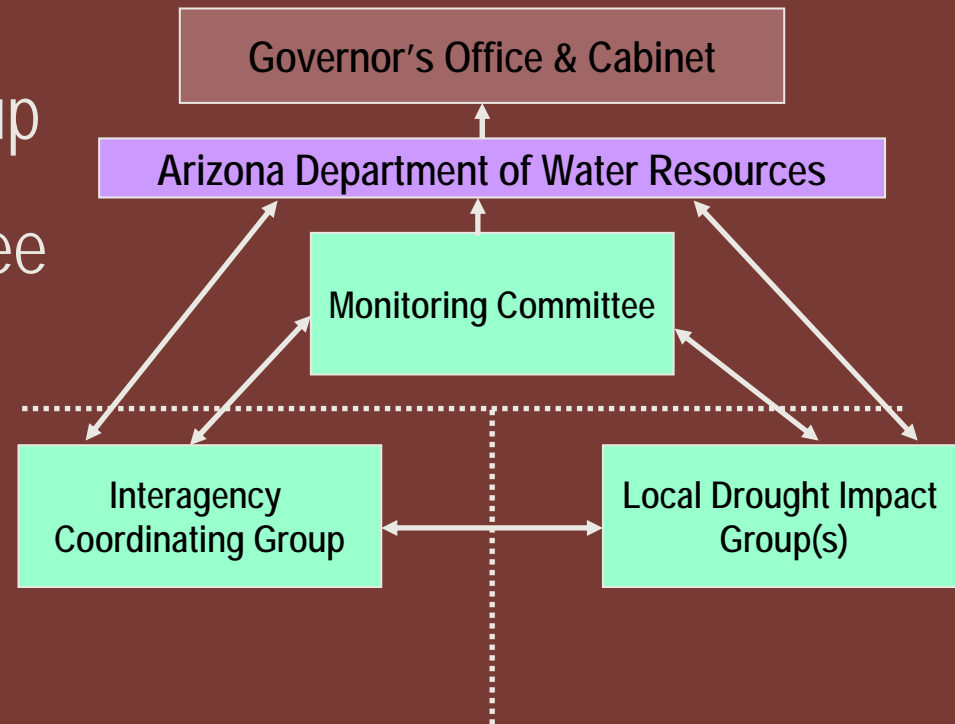
By creating a culture of conservation, we can greatly reduce the impacts of drought on our natural resources, economy, and quality of life.



Drought Plan Implementation

Key to the implementation of the *Arizona Drought Preparedness Plan* is the coordination of three structured groups

- Interagency Coordinating Group
- Monitoring Technical Committee
- Local Drought Impact Groups



Interagency Coordinating Group

- Directs state agency action to:
 - Assess
 - Implement
 - Develop response options
- Identifies needs for additional resources
- Advises Governor on drought action
- Reviews *Arizona Drought Preparedness Plan*
 - Recommendations for:
 - Improving monitoring
 - Implementation
 - Response



Provides an integral mechanism to coordinate and integrate drought planning and management on all lands within Arizona

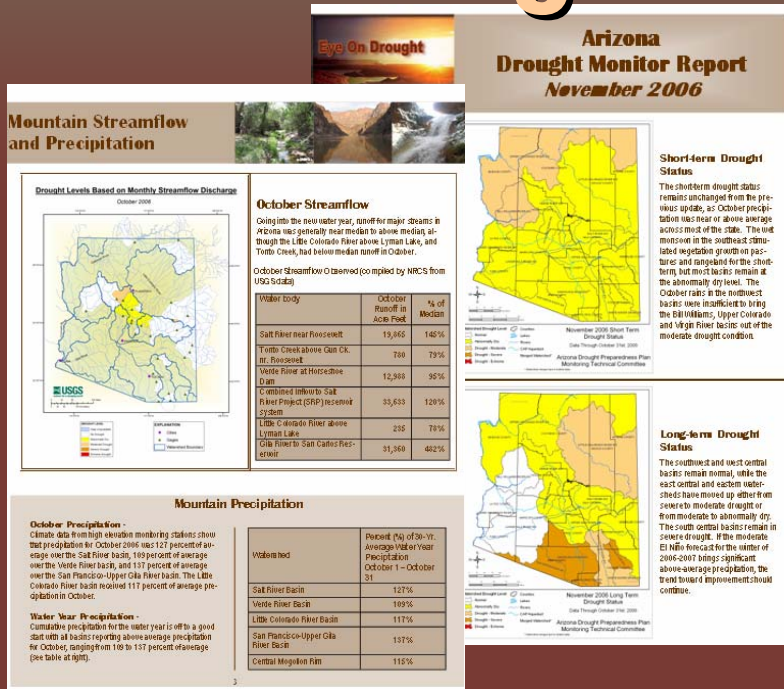
Drought Declaration

May 22, 2007 – Executive Order 2007-10

- Raise awareness of Arizona drought and encourage conservation
- 2nd decade of a statewide drought - persistent
- Calls upon citizens, businesses, water facilities, schools, governmental entities
- Implementation of the *Arizona Drought Preparedness Plan* and formation of local drought impact groups
- Minimize risk of a drought emergency

Fourteen state agencies reported 640 million gallons of water saved in 2007 compared to 2004 consumption rates, representing a 16% reduction.

Monitoring Technical Committee

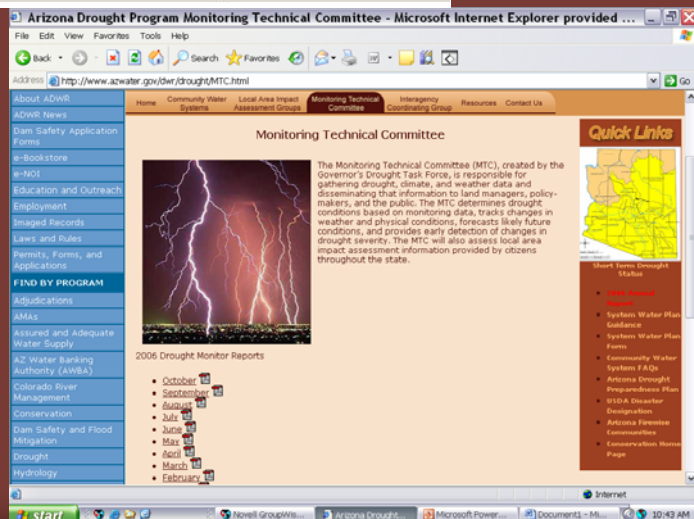


•Monitors and assesses drought conditions

•Produces monthly Drought Monitor Reports

•Briefs the Governor's Drought Task Force Interagency Coordinating Group on drought conditions

•Provides presentations and technical assistance to Local Drought Impact Groups



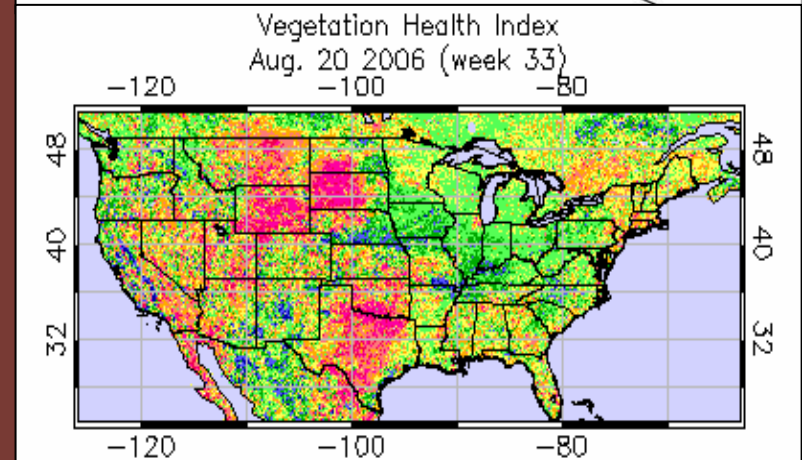
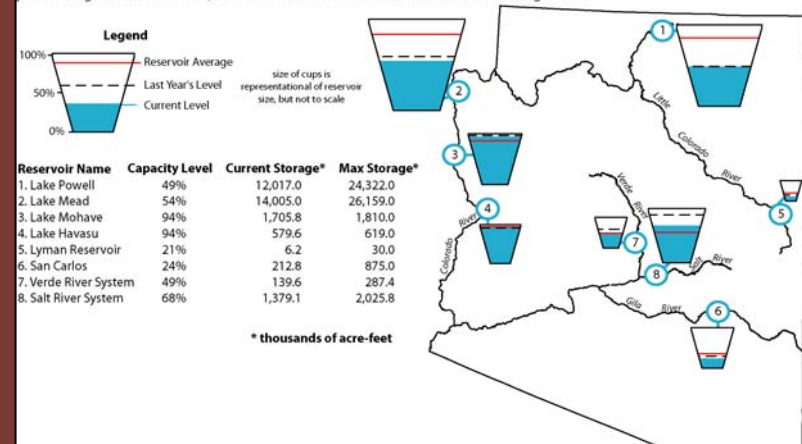
Drought Monitor Report

Monthly Publication

- Drought Status
- Impacts
- Arizona Reservoir Status
- Vegetation Health
- Mountain Streamflow and Precipitation
- Temperature and Precipitation
- Weather Outlook

Data provided by USDA-NRCS, graphic provided by University of Arizona - CLIMAS (Climate Assessment for the Southwest)

Figure 6. Arizona reservoir levels for August 2006 as a percent of capacity. The map also depicts the average level and last year's storage for each reservoir, while the table also lists current and maximum storage levels.

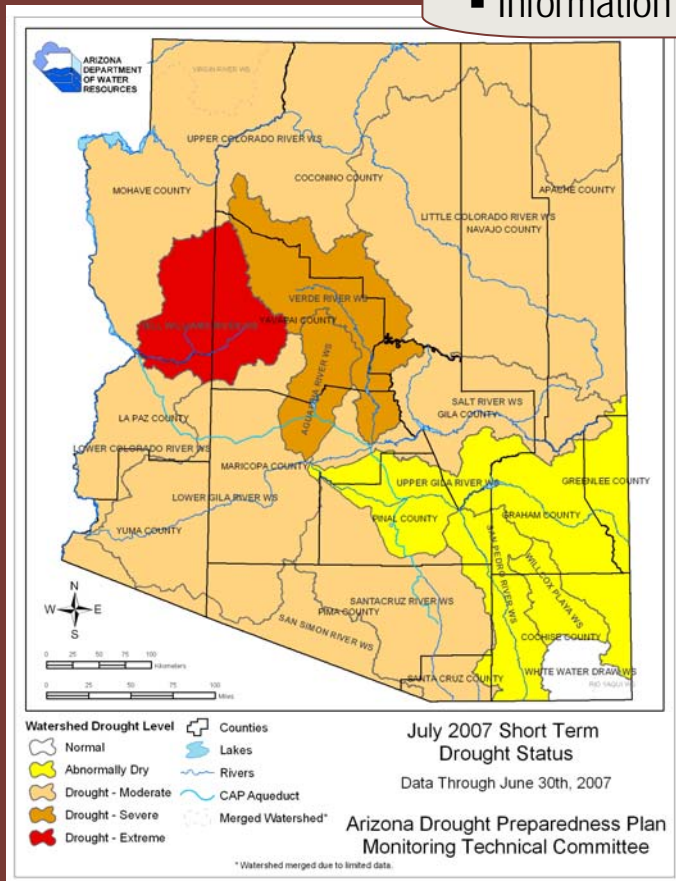


(Images taken by the National Oceanic and Atmospheric Administration's National Environmental Satellite, Data and Information Service (NESDIS))

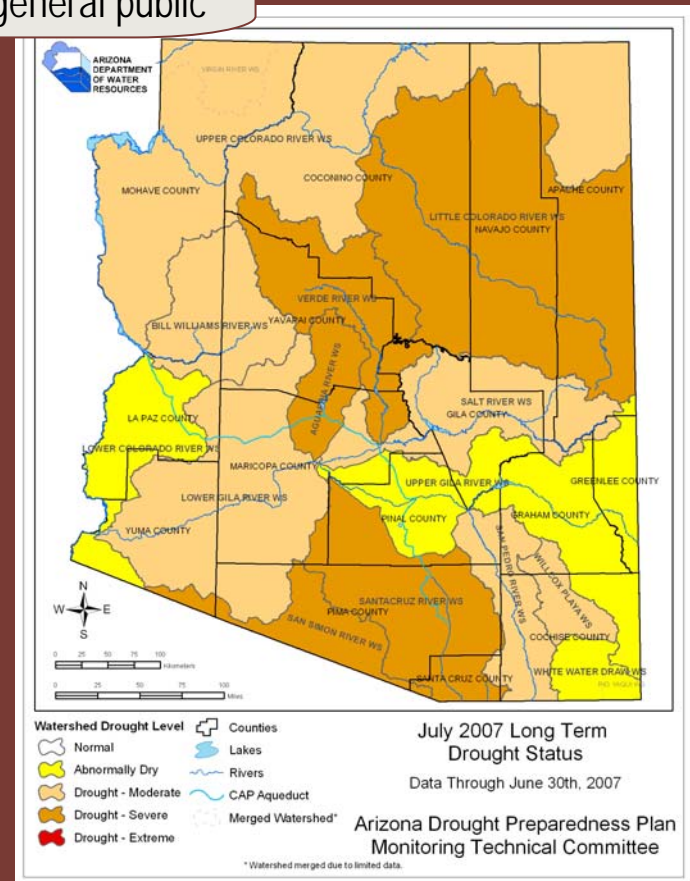
Drought Status Maps

July 2007

- Planning tool for resource managers
- Information resource for general public



Short-term Drought Status



Long-term Drought Status

Local Drought Impact Groups

Empowering Local Leaders

- Education: how to engage the public in drought planning after it rains?
- Monitoring: how do you obtain drought impact data and assess the severity, societal impacts, and costs?
- Mitigation: how do you coordinate local drought mitigation and response, conservation measures, and planning needs?



Local Drought Impact Groups

- Identify local drought-related impacts
- Define and assess
 - societal impacts
 - severity
 - loss and costs associated
- Identify response options
- Identify unmet needs or needs for response
- Identify and facilitate efforts to mitigate impacts
- Provide data to Monitoring Technical Committee

Participant Groups

Outreach & Education

- Improve awareness
- Education the public

Report Drought Impacts
checklist or online

DIRS-Survey Version 1

Name: [] Email: []

Address: [] Phone: []

Geographic Reporting Area: [] (U.S. Recent Year, Township/Range, Left/Right, Hydrologic Unit Code)

Costs and losses to agricultural producers

Impact	Observed?	Intend
A1: Damage to crop quality	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better
A2: Income loss to farmers due to reduced crop yield	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better
A3: Reduced productivity of cropland (land erosion, long-term loss of organic matter, etc.)	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better
A4: Insect infestation	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better
A5: Plant disease	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better
A6: Wildlife damage to crops	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better
A7: Increased irrigation costs	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better
A8: Cost of new or supplemental water resources development (well, dam, pipeline)	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better

Comments/specific issues: []

Costs and losses to livestock producers

B1: Reduced productivity of rangeland ☐ Worse ☐ Same ☐ Better ☐ Not Observed

B2: Forced reduction of livestock stock ☐ Worse ☐ Same ☐ Better ☐ Not Observed

B3: High cost of availability of winter for ☐ Worse ☐ Same ☐ Better ☐ Not Observed

B4: Water hauling to areas not easily ☐ Worse ☐ Same ☐ Better ☐ Not Observed

B5: Cost of new or supplemental water resources ☐ Worse ☐ Same ☐ Better ☐ Not Observed

(Wells, Dams, Pipelines)

B6: Supplemental feed necessary ☐ Worse ☐ Same ☐ Better ☐ Not Observed

B7: High livestock mortality rates ☐ Worse ☐ Same ☐ Better ☐ Not Observed

B8: Disruption of reproduction cycles ☐ Worse ☐ Same ☐ Better ☐ Not Observed

(Delayed breeding, fewer pregnancies)

B9: Increased drought-related production ☐ Worse ☐ Same ☐ Better ☐ Not Observed

Loss from fishery production

B10: Damage to fish habitat ☐ Worse ☐ Same ☐ Better ☐ Not Observed

Location/comments: []

B11: Loss of fish and other aquatic organisms due to decreased ☐ Worse ☐ Same ☐ Better ☐ Not Observed

Location/comments: []

(Above are the "latest version" changes. No changes yet from beta on.)

Environmental

Damage to Animal Species (One Early from local species here)

C1: Reduction and degradation of fish and wildlife ☐ Worse ☐ Same ☐ Better ☐ Not Observed

C2: Lack of food and drinking water ☐ Worse ☐ Same ☐ Better ☐ Not Observed

C3: Greater mortality due to increased contact with agricultural ☐ Worse ☐ Same ☐ Better ☐ Not Observed

(No animals used food from farms and producers are too tolerant)

C4: Disease ☐ Worse ☐ Same ☐ Better ☐ Not Observed

C5: Increased vulnerability to predators ☐ Worse ☐ Same ☐ Better ☐ Not Observed

(Birds, people, concentrated near water)

C6: Migration and concentration ☐ Worse ☐ Same ☐ Better ☐ Not Observed

(Loss of wildlife in some areas, too many in others)

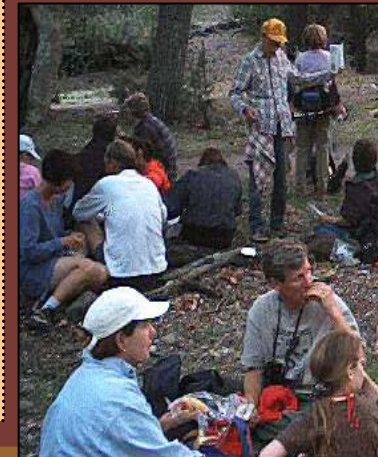
C7: Increased stress to endangered ☐ Worse ☐ Same ☐ Better ☐ Not Observed

C8: Loss of biodiversity ☐ Worse ☐ Same ☐ Better ☐ Not Observed

Monitoring

Goal Help the community, local and state government define **societal and economic impacts of drought** for better planning and response

Watersheds and Rain Gages



Drought Preparedness

- Develop mitigation and response strategies
- Identify funding and legislation needs

Local Drought Impact Groups

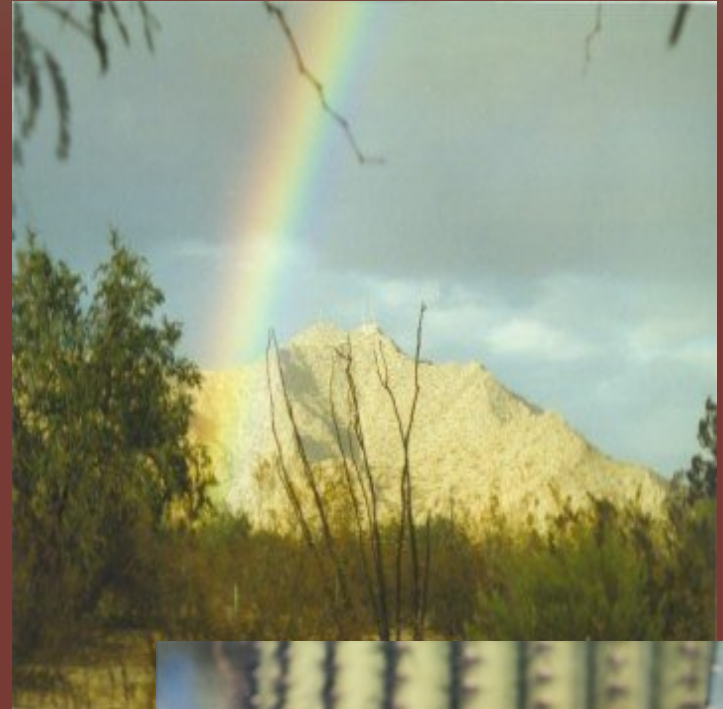
Estimated Timeframe	Counties
In progress	Cochise Pinal Santa Cruz Pima Yavapai Graham Greenlee
Initial stage	Apache Navajo Mohave
Up next	Coconino
To be determined	Gila Maricopa La Paz Yuma

Local Coordinators

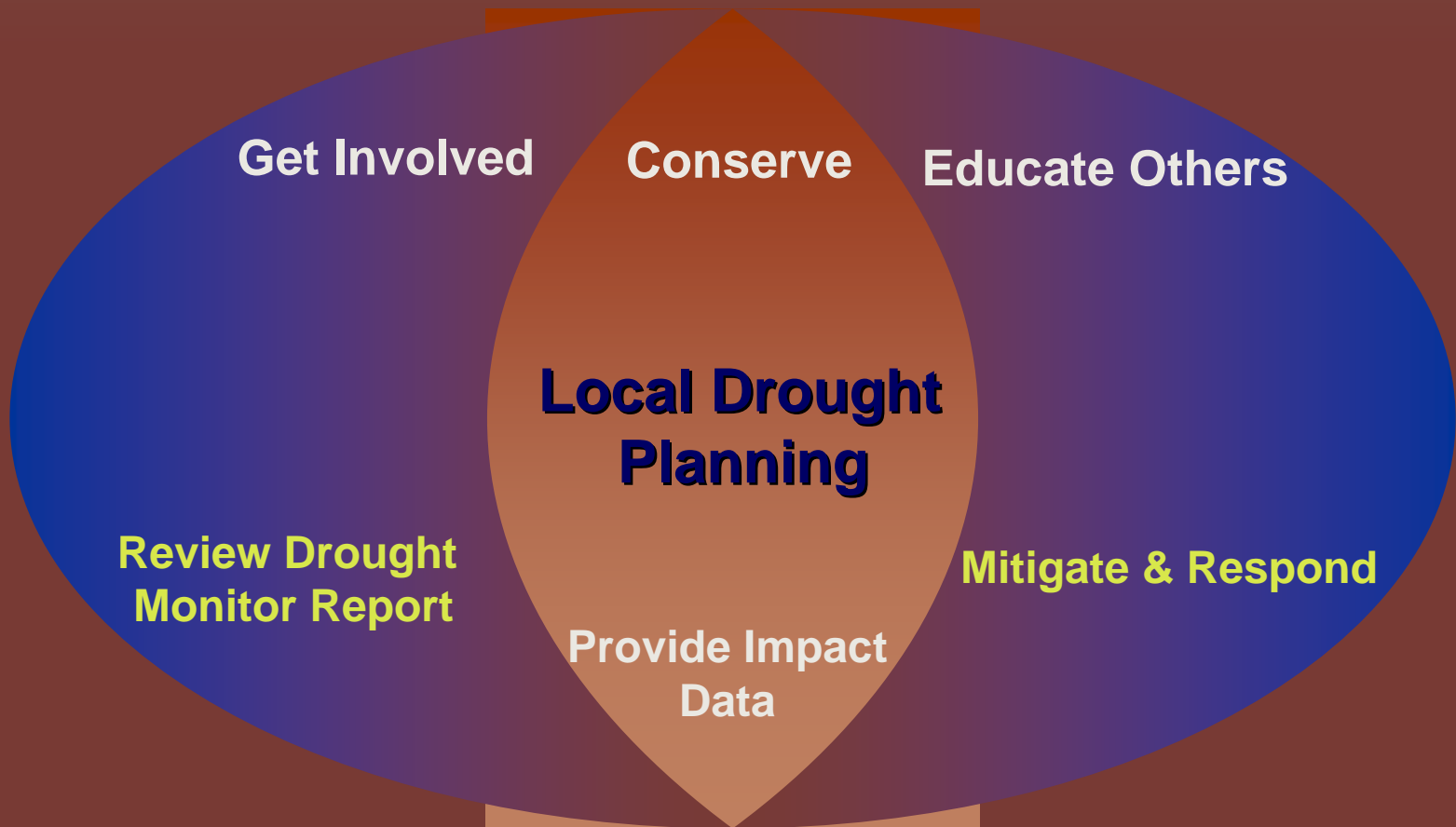
- AZ Cooperative Extension
County Agent
- County Emergency Manager

How Will Communities Benefit?

- Local impacts identified
- Accurate drought status
- Prepared to deal w/ drought
- Drought mitigation & response tailored to local area
- Reduce costs associated with impacts
- Regional planning



We Need You



What Can You Do Today?

- Be aware of your water use habits and determine where they can reasonably cut back.

Wise water use has the added benefit of saving you money



Outdoor Water Saving Tips

- Minimize grass areas
- Check all hoses, connectors and spigots regularly, and repair leaks as necessary
- Use a broom instead of a hose to clean driveways or sidewalks
- Cover swimming pools and spas
- Water plants and grass only when necessary

Indoor Water Saving Tips

- Check faucets and pipes for leaks, and repair or replace as necessary
- Choose low water-use appliances
- Replace toilets with high efficiency or dual flush models
- Do not pre-rinse dishes before putting them in the dishwasher

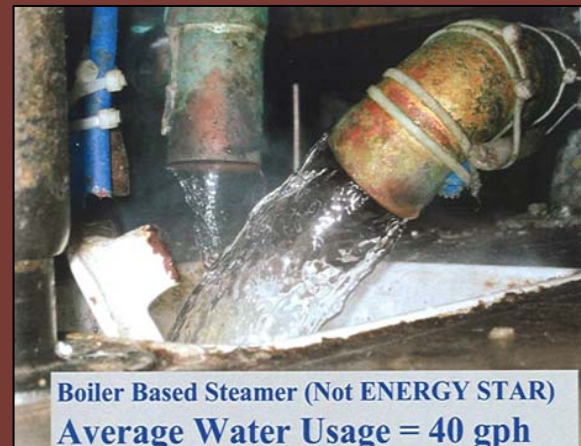
A 1-gallon per minute leak wastes 1,000 gallons per day and 525,000 gallons per year. Even a steady stream of water can waste more than 40 gallons per day

New Water Efficient Technologies

- Hot water re-circulating pumps
- Irrigation controllers
- Vertical stop devices for sprinkler risers
- Dual flush & high efficiency toilets



New Water Efficient Technologies



**Boiler Based Steamer (Not ENERGY STAR)
Average Water Usage = 40 gph**

Technologies Being Tested

- Water Efficient Salon Sprayers
 - People and pet applications



Education, Education, Education

- Coordinating
- Messaging
- Implementing

LDIGs play a vital role

Thank you !

Susan Craig, Manager
Community Water Planning
Arizona Department of Water
Resources
(602) 771-8533
smcraig@azwater.gov

*"This place of exceptional beauty is not ours
to own, it is only ours to care for, for the time
that we are here."*

Governor Janet Napolitano



USDA NRCS